Spacebased Wind in I Estimation of Ocean Surface Water Flux

in the past, estimation of large scale'ocean surface water flux (difference between evaporation and precipitation) was based on the conservation principal in which the flux is equated to horizontal divergence of the integrated water vapor transport. The computation of integrated water vapor transport requires measurements of the vertical profile of wind and humidit y in the at mosphere which, traditional 1 y, come from aerological data with insufficient sampling, and, recently, from numerical weather prediction (NWP) model with poor resolution. Spaceborne scatterometers which provide frequent observations of surface wind vectors at high spatial resolution may contribute to the flux estimation because most of the water vapor resides near the. surface. The influence of surface level winds is not confined to the surface but will be felt throughout the atmospheric column because of mass conserva- t ion. The integrated water vapor transport can also be equated to the product of the integrated water vapor (an operational spacebased product) and an equivalent wind. A global relation between the equivalent wind and surface wind has been explored through empirical method and a planetary boundary layer model, in an attempt estimated the flux entire] y from spacebased data. in convective area, vertical vapor advections depends on omega, the vertical velocity in pressure coordinate. The computation of omega at a certain level depends on the horizontal wind velocities at that level and all levels below. 'l'he impact of adding scatterometer winds to NWP data in the estimation of water flux was studied over the highly convective area over the warm pool in the western Pacific. By comparing rain pattern, the scatterometer winds were found to improve significantly the estimation of water flux.